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diameter, starting from a reservoir in which the aqueduct terminated on one side, and which were laid down the slope of the hill incased in masonry till they came to within about 38 feet of the bottom of the ravine, across which they were supported by a series of small arches, and thence taken up the opposite slope, discharging into another reservoir, from which the aqueduct started again. A number of these old pipes have been exhumed, and invariably found to be stamped with the initials TI, CL, CAES (Tiberius, Claudius, Cæsar). The old aqueduct of Contance, of Roman construction, is another instance of the use of the syphon. But did none of these examples exist, the whole system of water distribution in old Rome is a mere elaboration of this law of fluid motion. Many tons of lead pipes of various dimensions have been taken out from the excavations of Pompeii. They seemed to have been used in house service quite as commonly as in the present day, and plumbing in Rome and Pompeii shows far more creditable workmanship than much that we are obliged to acknowledge and suffer from. All the ordinary appliances and conveniences belonging to a well-understood trade are evident from these relics; the Pompeian turn-cocks were quite as good as our own, and far more sightly, oftentimes, indeed, beautiful works of art in themselves. Excellent earthenware pipes were also extensively used where the pressure of the water was not too excessive; and sometimes in the establishments of the emperors silver ones were laid through the palaces. Macænas had such in his beautiful gardens, and the baths of Caracalla were provided with pipes of the same extravagant material.

The lead pipes of the Romans were not drawn into tubes, as we make them, but were formed by layers of sheet lead bent round a bar or core and soldered together, then successive layers added on the exterior till the requisite thickness and strength was attained.

Evidence of careful calculation, both in the making and use of pipes and construction of their aqueducts is very constantly forced upon one's attention in the study of Roman hydraulic practice. The grades of the aqueducts are beautifully uniform, and show that the Roman engineers both possessed and used very delicate and excellent instruments in the erection of their structures.

I may mention that I have reduced the measures used in the above translation to the New York standard; the gallon is the ordinary New York gallon of 231 cubic inches, and the mea-

sures of length are the common feet, inches, miles, etc.

ARCHITECTURE AS A FINE ART.

A paper by CHARLES D. GAMBRILL, read before the American Institute of Architects.

PAINTING — Poetry — Sculpture: Poetry — Sculpture — Painting: Sculpture — Painting — Poetry: "These three"—but which is the greatest of these is manifestly a difficult problem to solve, from the multifarious methods employed in arranging the terms by those who have occasion to refer to the fine arts in the pulpit, on the rostrum, or on the written page. According to the mysterious prejudices of the individual taste, either of the combinations with which I began, or any other possible arrangement of those words—alphabetically, chronologically, or capriciously—is employed to designate the fine arts in their whole range, and in their appropriate rank.

It is not my intention to discuss this point, but the fact which I wish you to observe, and which has often piqued my professional vanity, is this—that in all of these enumerations, *Architecture*, the noblest of all, and the mother, motive and protectress of the other arts, is entirely ignored. I crown architecture with this triple diadem, because it was of necessity the first of the arts, and may be assumed to occupy these relations to the other arts, in spite of Winklemann's remark, that "The arts of sculpture and painting attained among the Greeks a certain excellence earlier than architecture, because the latter has in it more of the ideal than the former; it cannot be an imitation of anything actual, and must, therefore, of necessity, be based on the general principles and rules of proportion. The two former, which originated in mere imitation, found all the requisite rules determined in man, whereas architecture was obliged to discover its own rules by repeated trials, and establish them by general approval."

Now, I presume to declare, and hope to show, that the order should be—*Architecture*, painting, sculpture and poetry—*these four*; and that the greatest of these is architecture; arranging the last three, *the daughters*, as you will.

And in the first place, with all due modesty, and with proper regard to the public opinion, or rather, *ignorance* of the matter, we must establish the right for architecture to be considered a fine art, and its professors, artists. I may venture to make the assertion *here*, though my presumption would be hailed with ridicule by the profane horde which condescendingly styles itself our

patron—that architecture *is* an art, and that its professors *are* artists. I do not expect that this announcement will be startling to you, nor do I claim your attention, by any new charm of expression, to a development of ideas, trite enough among ourselves—but I make this feeble appeal with the hope of arousing your interest, long lulled in indifferent forgetfulness, to make a bolder stand for the dignity of our high calling, and to assert with a firmer mien the noble purposes and rank of our beloved craft.

It will be a difficult matter to establish this point of precedence, as we have ranged against us most acute critics—of our own profession, too—and, therefore, traitors to it. But I shall not fear to combat for my position boldly, if not successfully. Now, it is no man of straw against which my lance is raised—I am inspired by no Quixotic chivalry to make an onset on a defiant windmill—but there is an actual foe before us, stopping our progress by an obstinate refusal to recognize our might and right—malevolently closing against us the doors of the temple of Art—withholding from us the chaplets due to our merit, our zeal and our aspirations, till apathy and discouragement have affected our ranks; silencing alike those who chafe under their false position, and those whose indifference has made them callous to the wrong.

Even among our brethren in those arts, whose works, by the by, are only accessories to ours, there is an unwillingness to acknowledge our fellowship—much less our equality; and while we cannot expect them to yield to us the supremacy, we cannot but condemn and pity the supercilious tone of that criticism which slightly nods approval or frowns displeasure at designs, in the least line of which there is often a thought more noble, and a feeling more poetically intense than can be found on endless rolls of their own canvas, in illimitable quarries of their own marble, or in the most ponderous folios of their own epics.

Chief of all, in the immortal group of the Hemicycle, sits Apelles—while *second in honor*, at his side and *behind* him—indignant, with a stern defiance, of which the artist's pencil was all unconscious—behold! the creator of the Parthenon!

One difficulty to be overcome is the want of a united opposition to this melancholy hallucination among ourselves; there is an “irrepressible conflict” between the Classic and the Gothic architects—an irreconcilable antipathy between the carvers of crockets and the fluters of columns, a never-ending recrimination between those

whose sole reliance is on the pointed arch, and those who repose safely on the lintel. This antagonism, if not always openly expressed, is generally tacitly implied by the total ignoring in practice or in writing of the one by the other. And, though a compromise is sometimes attempted by cloaking a Classic motive with Gothic moldings, or in adapting Classic details to Gothic masses, successfully, perhaps, in some cases, yet, as a general thing, the flimsy mask does not conceal the features which peep out on all sides, and betray the real character, like Falstaff's beard, when he hoped to escape under the guise of a washerwoman.

This view may appear to be exaggerated, because we hesitate to acknowledge the existence of these petty jealousies, but we cannot disabuse the public mind of its low estimate of our position till we have asserted, with proper dignity, our claims to an equal consideration with the other arts, and, untrammelled by any narrow predilections for this style or that, work harmoniously together with the brotherly unity of the Free Masons of old.

A gulf as wide as that between the Romanist and the Calvinist may yawn between the Renaissance and the Gothic architect, but it is not chimerical to hope that in the glorious future to which we look, that gulf may be bridged over; for not until (without abating their affection for their favorite models) they can behold with complacency the creations of each other's genius, and acknowledge with the pride of members of one family the sublimity alike of St. Peter's and Cologne, can they hope successfully to occupy a place among those who have hitherto monopolized the name of artists. For as long as the advocates of rival styles refuse to perceive in each other a feeling for, or a knowledge of, the art, will the uninitiated public, sympathizing now with this side, now with that, at length become so confused with the conflicting statements as to withhold the coveted title from both.

Now, that I have stated that architects *are* artists, though the uneducated, and those in general parlance called artists, refuse to recognize us as such, and though *we* have been too backward in pressing our credentials, let us see what our pretensions are.

The painter has in his own hands the beginning and the end of his art—he both designs and executes his works, and his reputation depends fully as much upon his skillful manipulation of the brush as upon the inventive power of his imagination. But the sculptor's fame may rest with his clay model—the amanuensis may transcribe the

glowing thoughts of a Milton, and the orchestra may interpret the score of a Mozart; in short, the workman gives us the final result, and executes the master's thought. But it is the same with the architect, so that it is not upon his mechanical dexterity that he must base his pretensions to be ranked with the painter as an artist—for the sculptor, poet and musician sit on the dais with him, though an uncombed Italian chisel the block and a phlegmatic Dutchman drum out the score.

Again, this exclusive appropriation of the name of artist cannot be founded on the durability or value of the material which represents the thought—for the temple will last at least as long as the canvas above the altar, and the porphyry and serpentine columns of the shrine are as precious as the Pentelic marble from which the Venus is chiselled. The architect's pallet glows with colors as brilliant as the painter's, for the pigments are of Nature's own mixing—and the monuments which perpetuate his fame are as enduring as the everlasting hills from which his blocks were quarried; for if the earthquake brings the tall tower tottering to its base, the landscape which it adorned also feels the devastating shock, and our affections entwine the ruins of both alike in a loving embrace. The Rhine, so beloved of painter and poet, rolls between hills no more picturesque than those which confine our own lordly Hudson, but the *architectural* ruins which crown the summits of the historic hills of the European stream, have clothed them with their peculiar beauty and enveloped them with peculiar interest. I would add, as a passing remark, that the same attraction will lend a charm to our scenery, when the dilapidation of time shall have invested some of our nondescript villas with that air of respectability which always protects departed worth of a doubtful character with the charitable and inevitable "*Nil nisi bonum*."

But when the painter displays his portfolio laden with sketches from the Rhine, from Pæstum, or the Campagna, we hear no tribute to the genius in commemorating whose fame, he labors to build up his own.

As Michael Angelo was at one and the same time, poet, painter and sculptor, able to fill the niches of the temple which he designed with his own statues, to decorate its ceiling with his own frescoes, and to record its history in his own verse—as Giotto and Raphael, and many other of the giants who lived in those days, turned with an easy familiarity from one art to the other, we must suppose, either that the genius of an architect is not incompatible with that of a

painter, or else, that like Rarey's horse which could not be tamed all over, these old masters could not be artist all over, and that their architectural proclivities must be reckoned on the side of their failings. Now our friends of the easel, at least the most degenerate of the descendants of those great men, appear to adopt the latter conclusion in their opinion of the architect; but in judging of themselves, they lay the flattering unction of the former to their souls, on the principle that the greater contains the less, and accordingly pretend with great confidence to pronounce judgment on the architect's work, because, forsooth, Buonarrotti built St. Peter's! so that they make the "unskillful" gape in ignorant wonder, and almost persuade the "judicious" that it is only the want of inclination that prevents them from doing the same. How they stultify themselves through this mistake a recent decision in a competition (I would state that I was not a competitor) most lamentably proves. A committee, by a common fallacy and with a presumptuous confidence of which we cannot complain too much, prefer the results of a long tentative process which they call experience, and which by their own confession is only founded on a series of failures—to the well digested plans of architects, who draw on the experience, not of their own lifetime, but of all times, and of the greatest minds. And yet with what jealous indignation would they receive any instruction from an architect on the composition of the *lines* of a painting or in the harmonious combination of their colors. After elaborating a plan which would have amused and puzzled and disgraced a carpenter, they failed to see in the studied efforts of experts, that there is art in the disposition of a plan, as well as in the decoration of a façade, and that the unity for which they make such a clamor, must be one which pervades the whole structure, showing the impress of one mind, within and without. To use an expressive phrase, applied to figure painting or carving, you must feel the anatomy beneath the drapery—a canon too often neglected in our art, where a labyrinth is so frequently concealed behind a symmetrical or monotonous exterior. This fault is sometimes due to a want of study on the part of the architect, but in cases of a subdivision of labor, such as that which suggested these remarks, we must either be guilty of a falsehood or frankly express the deformity in the elevation. Architectural cobbling is not impossible, but if you give the shoemaker the last you must be responsible for the shape of the shoe.

To such an extent is this feeling of superiority

carried that an architect is not only not received as an artist, but his opinion upon a work of art is not accounted of more worth than that of a traveller tolerably conversant with Murray. He may criticise the moldings of the pedestal, but not the statue which stands upon it! Our elegant diletanti who have gazed upon the "*originals*" in a continental trip of three months, and discourse so eloquently upon the chiaroscuro of Correggio, look down upon us with a benign condescension, and instruct us knowingly in the beauties of the great painters. Nay, they know to a module the proportions of the Madeleine, and will hold their ground against you, as to its resemblance to the Parthenon—and after having rushed with railroad speed through the Vatican and the Luxembourg—from Milan to Rouen, they will confound you with misquotations from the guide-book in any debate on the frescoes of Leonardo, or the cathedral of Erwin von Steinbach. Of the abstract beauty of the Classic they must speak with some reserve, but on the gorgeous poetry of the Gothic they can dilate with very plausible and magniloquent platitudes.

Quatremère de Quincy, in his essay on "Imitation in the Fine Arts," having ranked the arts as follows: Poetry, Music, Painting and Sculpture, places Architecture next, with these remarks: "Architecture which does not imitate anything real or positive, is always classed in its due place in this imitative scale, its office being to employ matter, its forms, and the relations of their proportions, to express moral qualities; at least those that nature shadows forth in her works, and which produce in us the ideas, and their correlative emotions, of order, harmony, grandeur, unity, wealth, variety, durability, eternity, etc., in such a manner that the material of the art, which with the generality of persons, is the object of a sensual admiration, may be only a means employed by the artist of leading our minds to intellectual enjoyments." Yet, the very qualities which make architecture the lowest among the arts which depend on imitation for their excellence would make it the highest if we reckon by the order of talent required to represent with such limited means, this noble catalogue of ORDER, HARMONY, GRANDEUR, UNITY, WEALTH, VARIETY, DURABILITY AND ETERNITY. It resembles the majesty of creation itself, as was stated here in a paper read at a recent meeting, or it is at least the nearest approach to it within mortal power, this producing from a chaos of the already created material, those reverend and awe-inspiring temples, which the unanimous judgment of every age has pronounced to be *good*. Nor is this a mere

sacrilegious conceit of our own, for priest and orator ever refer to the Creator—as if speaking of one of his greatest attributes, as the Divine Architect—though we only hear of Nature as the artist of the golden sunset, and the composer of the varied landscape.

Ruskin has, I believe, a remark in one of his works, derogatory to the high rank of architecture, on account of its practical application in ministering to the necessities of life. But this very consideration, as I conceive, makes it more worthy of the rank I claim for it, and we have the authority of a painter even on this point, Sir Joshua Reynolds—that it is "this application of science which alone gives compass and dignity to any art," and that "in Painting as in Architecture there is an inferior branch of the art in which the imagination appears to have no concern." That is to say, I presume, so much of our art as it has in common with engineering. Again he says "to pass over the effect produced by that general symmetry and proportion, by which the eye is delighted, as the ear is with music, Architecture certainly possesses many principles in common with poetry and painting.

"Among those which may be reckoned as the first, is, that of affecting the imagination by means of association of ideas. Thus, for instance as we have naturally a veneration for antiquity, whatever building brings to our remembrance ancient customs and manners, such as the castles of the barons of ancient chivalry, is sure to give this delight. . . . For this purpose Vanbrugh appears to have had a recourse to some of the principles of the Gothic architecture; which though not so ancient as the Grecian, is more so to our imagination, with which the artist is more concerned than with absolute truth."

We have thus, by a sort of poetical justice, pitted a painter against an architect in vindication of our claims to have architecture considered a high art—and if it fall short of this pretension on the score of its being mechanical in one of its grosser phases, we have as an offset to this in painting, that part of it which depends on mere imitation; and this, too, an imitation which calls into exercise lower faculties of the mind than those required in the practical execution of the architect's work, or even in the building of those meaner edifices, which, while they make no appeal to the imagination, the end of all art, yet demand a manifestation of serious thought in order that the purpose of the building may be most appropriately and economically attained.

There is an imitation in architecture also, and

it is of a higher quality than exercised in painting itself. For, according to an ingenious critic, Mr. Garbett, "the true excellence of that imitation is found not in copying what nature presents, but in doing as nature does. The highest kind of imitation in every art," he says, "may be reduced to this principle, but it is the peculiarity, and should be the boast of architecture, that it consists in this highest and most difficult kind of imitation alone, and has not, like painting and sculpture, any low, narrow, matter-of-fact imitation (more properly called copying) in which those who are incapable or unprepared for this only real imitation may take refuge."

There is a prejudice in the public mind akin to that which prompted Ruskin's remark, because architecture is looked upon merely as a business or profession—because the architect works out his inspiration in such an unpoetic place as an "office," like the merchant or physician, and courts the public patronage through the vulgar medium of a sign.

The fact that he is thrown in such close and constant contact with the humble artisan, detracts even in this democratic country from what appears to be the aristocratic pretension of our claim; and when that claim is granted the thousand hangers-on to the skirts of architecture will seek to share the promotion, and the practical plumber, the practical mason and the practical carpenter, will become the artist in lead, the artist in brick and the artist in timber. Although we see blazoned forth in a prominent corner in Broadway, "Studio for signs," what architect would venture to invite a patron to *his* "studio?" Would it not provoke a laugh or frighten him off with the spectre of a ten per cent.? There are some respects, however, in which we are placed on a par with artists:—the architect, like the poet, gazes out from a garret on a picturesque forest of doctored chimneys, and a consoling bond of sympathy is offered him with every child of the Muses, in the paltry recompense with which art is ever grudgingly remunerated. What halcyon days will those be for our much maligned profession when the guardian of the portals of the Academy, will reject our proffered quarter and welcome us with a grim smile to an equal participation in the privileges of that hallowed precinct!

Whatever may have been the relative position of the arts in times past, I have no doubt that in the race which has been run since the revival of the arts, architecture has maintained an honorable place, even if it has not outstripped the others. Time will not allow me to trace the com-

parative progress of the arts during this period, but I think I may be safe in saying, that though no artist could be found who could paint a companion to any of the masterpieces which have immortalized Michael Angelo, Raphael or Tintoretto, it would not be impossible, with the same unlimited pecuniary resources, and with the advantage of our superior skill in engineering, to build temples whose domes would overshadow that of Florence and whose sculptures would bear comparison with any of the niched entrances of the Gothic cathedrals. The only thing wanting to this would be that sympathy from the age, and that devotion in the architect, which was one great secret of the success of the fathers of our art—the secret of the *Non nobis, Domine, non nobis*.

I will not weary your patience by a more tedious elaboration of these suggestions, but I hope that I have made out a sufficiently clear case by showing that architecture possesses in common with painting, poetry and sculpture, all that entitle them to the name of art, and that it possesses these qualities in a higher degree, together with others which ought to give it a higher place.

To conclude, there is one consideration which exalts architecture to a superior dignity, and that is its province as the grand chronicler of the world's history. On its indelible pages are stamped the very feature of the times, and the tastes, the religion, the liberality and the prosperity of the builders will be deciphered from its mute hieroglyphics by the Layards who in remote ages shall come to wipe away the dust and lay before the eyes of a curious posterity the strange legends of a former time. We alone will be present in our works to future ages, when the canvas and the parchment shall have crumbled into dust—from our works alone will be gleaned the data for future historians and

"Not from the grand old masters
Not from the bards sublime,
Whose distant footsteps echo
Down the corridors of time."

—♦—

WELL-BEING is the law of merely animated creatures—order is the law of intelligence.

All are born to maintain that good order which few are born to establish.

Weakness which brings back order is of greater value than the strength which disturbs it.

The satisfaction which one experiences in being just against himself comes from a return to order through a knowledge of truth.

He who has imagination without knowledge has wings, but no feet.—*Joubert*.